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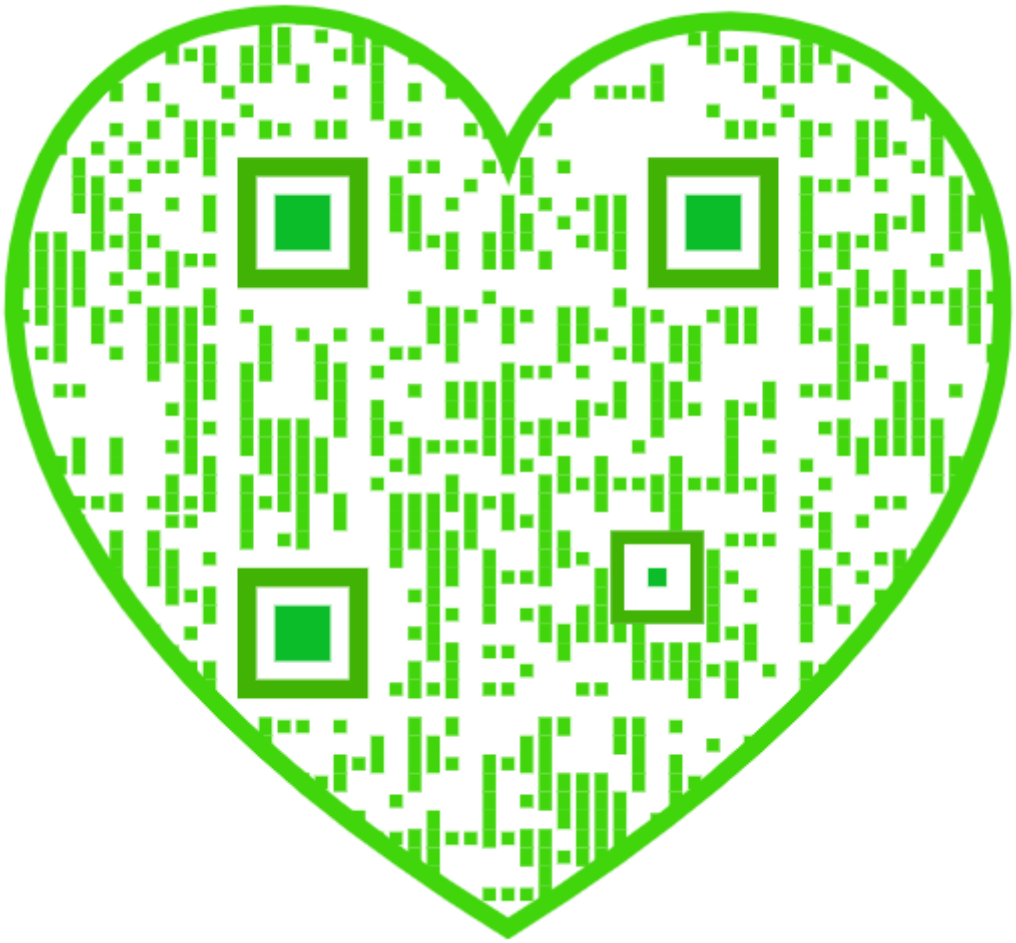

DAIRY FARMING:

ITS ADVANTAGES,

AND

THE MEANS FOR ITS IMPROVEMENT.

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DAIRY FARMING.

Considerable attention has been given, of late, to so systemize the business of dairy-farming, that, while the annual products of the farm may be increased, its expenses are diminished.

Dairying embraces a wider field of operations, it is believed, than where almost any other kind of farming is made a specialty; since, in addition to the manufacture and management of dairy-produce, particular branches of farming are also to be regarded as specialties, and being so closely linked together, the success of the dairyman depends more or less on his intelligence in reference to, and proper management of them all.

Cheese making, of itself, in all its details, is an art which requires much knowledge, and long, careful, and varied practical experience. And yet the success of the dairy-farmer will not depend, altogether, on his ability to manufacture the largest quantity, and best quality of cheese from a given quantity of milk. Back of this lies the production of milk—the breeding—care and treatment of stock, and further back, the production of food, the application of manures, and all the various operations of cultivating the soil, and growing crops.

It is estimated there are considerably more than one million of milch cows in the State of New York, and the number of acres employed for raising grain, grass, hay, &c., for their maintenance through the year, will doubtless exceed four millions, or nearly if not quite a quarter of all the improved land in the State. The capital invested in land, cows, and utensils for conducting the dairies of the State, on the above assumption, will reach at least $140,000,000. While the value of labor annually required, can not fall short of $20,000,000.

Thus it will be seen, $160,000,000 in capital and labor, are annually devoted to this business in the State of New York alone.

The average annual produce of all the cows in the State,* if represented in cheese, it is believed would fall below 300 pounds per cow, which at seven cents per pound, would in round numbers amount to $21,000,000. But the average should be made to reach at least 500 pounds per cow, or $35,000,000, showing an annual loss of $14,000,000. This estimated loss can not be regarded as too high, since even in old dairy districts, and among practiced dairymen, from imperfect dairy products, poor stock and their improper treatment, injudicious management of pasture and meadow lands, and in the securing of crops, immense losses in the aggregate are annually sustained.

A plain, practical treatise on dairy-farming, a treatise that shall describe minutely the best methods of conducting the business is much needed. Enough, perhaps, has been written, from time to time, on the subject, but it is scattered throughout various agricultural journals, and in volumes of reports, and therefore is not available to the great mass of readers. Much that is written too, is found to be for the most part theoretical, and either not yet proved of practical utility, or advising what would require too great an outlay of capital, and therefore beyond the means of the majority of farmers. Yet it is not too much to affirm, that dairymen, generally, have within their reach all the elements and means necessary for their complete success, if each would avail himself of the experience of others, in all that tends to improve the dairy, or the several branches of the business in which he is engaged. He should bear in mind that it costs as much to keep a poor cow as it does a good one, and that no more

* The State census for 1855, gives the number of cows in Herkimer county at 36,653; improved land, 267,414 acres; pastures, 122,730 acres; butter made, 1,305,377; pounds cheese, 9,068,519; milk sold, 54,960 gallons.

The number of cows in the State is put down at 1,068,427; butter, 90,293,073 pounds; cheese, 38,944,249 pounds; gallons of milk sold, 20,965,861; pastures, 4,984,114 acres.

The U. S. census, 1860, gives the number of cows in Herkimer county 41,566; improved land, 279,398⅛; butter, 1,251,872 pounds; cheese, 10,901,522 lbs.; milch cows in the State, 1,128,634. The amount of pasture land is not given.

The following table will show the number of pounds of butter and cheese made in 1850, according to the census of that year, in the six leading dairy States of the Union, or in those States reported as making over 3,000,000 pounds of cheese:

	No. cows.	Lbs. butter.	Lbs. cheese.
New Hampshire	94,277	6,977,056	3,196,563
Vermont	146,128	12,137,980	8,720,834
Massachusetts	130,099	8,071,370	7,688,142
Connecticut	85,461	6,498,119	5,363,277
Ohio	544,499	34,449,119	20,819,542
New York	931,324	79,766,094	49,741,413
Total	1,891,788	147,899,992	94,929,771
Total in United States	5,248,633	313,266,962	105,535,219

expense is incurred in manufacturing the finest qualities of butter and cheese, which are readily sold at high prices, than it does a poor article, which drags in market, and not unfrequently is wholly unsaleable.

In the volume of Transactions for 1860, I gave a brief outline of the manner in which cheese-dairying was conducted in Herkimer county; in the present treatise it is proposed to further elucidate the subject, and to present some suggestions on points not fully discussed in that paper.

PASTURES—THEIR TREATMENT, &C.

Before entering upon the business of dairying, it will be well to consider whether the land is adapted to grazing—whether it has springs, and streams of pure and never-failing water, and so located that stock can readily and at all times slake their thirst, without being driven, or obliged to make a special journey for the purpose.

A scarcity of water, or where it is poorly located on extreme or out of the way parts of a farm, will tell heavily on the production of milk during the season, even though the animals have an abundance of food.

Milch cows are averse to traveling out of their way to obtain water, and will often endure thirst for hours, rather than leave the herd on a special journey for it; they do not need much exercise, and should be subjected to as little as possible. Hence when nutritious food is abundant, and pure water of easy access, so that quietness may be maintained in the herd, the best results are obtained.

The management of pasture lands, will be different with different soils. Broken and uneven surfaces, hard to be tilled—hill sides, where the surface lies near rock—thin or sandy soils, it is evident must be studied as to their character, and treated according to the peculiar circumstances or difficulties that may surround each.

Lands natural to grass—and these embrace a greater portion of the clays and shales—produce pasturage year after year continuously, if properly attended to, and would often be injured for pasture by plowing and re-seeding. The impression sometimes prevailing that newly seeded meadows producing large yields of one or two kinds of grass for hay, would, if turned to pasturage, be equal to, or of more value than good old pastures for grazing milch cows, is erroneous. Rich, old natural pastures, have been found to con-

tain 1,000 plants to the square foot, having twenty distinct species of grasses, and the newly seeded ground would require to lie many years to get that thick matted sward, and of so many species of grasses, at least when seeded, as is common, with two or three favorite species.

The following table and remarks, from Flint's work on grasses, may not be out of place in this connection. Be it understood, however, in the remarks above, or hereafter to be made, we are not deprecating a judicious rotation of crops on dairy farms, nor advocating the continuance of a pasture because it happens to be *old.* Pastures will fail and become foul, and the grass scanty and poor; such lands need breaking up from time to time, and are vastly improved by thorough cultivation, and with increased quantity and quality of products when again laid down in grass. But the practice common with some, of breaking up large fields of good, clean, sweet sod, which perhaps may have been a trifle injured by the too close cropping for a season, in order to raise grain for a few years, and frequently too without the application of manures, is believed to be pernicious.

We have seen rich, old pastures, solid in growth, and yielding largely, plowed up, for the reason that a good crop of corn was wanted, and *that* particular field seemed best suited to the purpose. It did produce good grain crops, but after being got back again into grass, the annual yield was very much less than on the old turf.

AVERAGE NO. OF PLANTS AND SPECIES TO THE SQUARE FOOT OF SWARD.

Character of the Turf.	Whole No. of plants on the square foot.	Natural grasses.	Clover and other plants	Dis. species.
1. A square foot taken from the richest natural pasture capable of fattening one large ox, three sheep to the acre, was found to contain	1,000	940	60	20
2. Rich old pasture capable of fattening one large ox and three sheep, per acre	1,090	1,032	58	..
3. Another old pasture contained	910	880	30	12
4. An old pasture of a damp and mossy surface	634	510	124	8
5. A good pasture two years old, laid down to rye grass and white clover	470	452	18	2
6. A sod of narrow leaved meadow grass (poa angustifolia,) 6 years old	192	....	...	1
7. A sod of meadow foxtail, by itself, six years old	80	....	...	1
8. Rye grass, by itself, same age	75	....	...	1
9. Meadow, irrigated & carefully man'd,	1,798	1,702	96	..

"These plants in each instance," says Mr. Flint, "were counted with the utmost care by a farmer now living in this State, (Massachusetts) then in the employ of Mr. Sinclair, and the correctness of his results may be relied on.

"Now it is a well known fact that the sward of a rich old pasture is closely packed, filled up, or interwoven with plants, and no vacant spaces occur. Yet in a closely crowded turf of such a pasture, only one thousand distinctly rooted plants were found on a square foot, and these were made up of twenty different species. The soil should be supplied with a proper number of plants, else a loss of labor, time and space will be incurred; but however heavily seeded a piece may be with one or two favorite grasses, small vacant spaces will occur, which, though they may not seem important in themselves, when taken in the aggregate, will be found to diminish very considerably the yield of an acre, even if they are so small as not to be perceived. And undoubtedly some allowance should be made for the seeds and young plants destroyed by insects, birds and various accidental causes; but even after all deductions for these, we see that in this State, at least, there is no deficiency in the quantity of seed used, and the imperfectly covered ground cannot be explained in this way."

Sinclair too says: "When an excess of grass seed is sown, the seeds, in general, all vegetate, but the plants make little, if any progress, until from the want of nourishment to the roots, and the confined space for the growth of foliage, a certain number decay, and give the requisite room to the proper number of plants; and that will be according as there are a greater or less variety of different species of grasses combined in the sward."

Old pastures that have a fine thick herbage of several kinds of grasses adapted to the soil, and coming to maturity at different seasons, will generally be found to produce more milk and from which a richer, better flavored, and finer quality of butter and cheese are manufactured, than from the rank growth of grasses on newly seeded lands. Again, newly seeded lands will not bear that close cropping, nor will they endure drouth like permanent pastures.

Doubtless when the land has been underdrained, deeply subsoiled, enriched, and then seeded with a judicious admixture of grasses of the several species best adapted to the soil and climate, a permanent pasture of the best character may be soon obtained, and would amply pay all expenses for such cultivation. Yet few

comparatively, can be induced to enter upon this system of farming, and the next best course is to be considered.

In the treatment of old pasture lands, injured from close cropping, or other causes, but not wholly run out, it will generally be better not to break up, but to leave them for a part of the season to resuscitate, running a harrow over the ground in early spring, and sowing a mixture of timothy, blue grass, red top, the clovers, red and white, and orchard grass, making an application of plaster, pulverized bones, ashes, salt, or other stimulating fertilizers. Ashes, leached or otherwise, remove mosses and are a valuable application to grass lands.

There are pastures in Herkimer county, which have not been broken for more than forty years—many that have never been ploughed perhaps but once or twice, years ago when the country was new, that are yielding an abundance of nutritious food, en during year after year, close cropping and drouth, without any perceptible injury or tendency to run out, and yet have received no top dressings, beyond the usual application from time to time of gypsum. The grass on these lands springs up green and fresh, with thick fine bottom, a marked contrast throughout the season, to occasional patches on the same soil, recently re-seeded. Stock too, it will be observed, are to be more frequently found on these pastures, thus showing that the grass is sweeter or more nutritious, than on the newly seeded parts.

To plow and cultivate such lands, would be to destroy the original grasses, and after re-seeding, many years must intervene before the new grasses can obtain that firm possession of the soil, and the enduring vigor and variety of the old sod.

The reasons for the successful growth of these natural grasses, need not here be discussed—the decomposition of leaves, wood, roots and other vegetable matter for centuries, seems to have accumulated a surface soil, capable of supplying the best possible food, for growing these plants in perfection, which intermixed as they are with artificial grasses, timothy, clover, &c., form a more closely matted sward, and produce an herbage more nutritious, and better adapted to the animal system, than that from newly sown seeds on recently cultivated lands.

There are large tracts of country, the soil of which is unsuited to hold the grasses of any approved kind, for any great length of time.

They are not natural to grass, and therefore unreliable, and

cannot be profitably employed in stock farms. The character of the soil is usually of a light texture, sandy or gravelly; they will require to be frequently plowed, and re-seeded with clover, timothy, or other rapidly maturing grasses, and for short periods may yield good crops. But such soils do not seem to contain the elements necessary for the establishment of permanent pastures and meadows, being more suited to the growing of grain and other crops.

These lands stretch away through the Middle, Western and Southern States, leaving comparatively but narrow belts and patches of land adapted to the dairy. So far, experience has shown that the real dairy soils are very limited in extent, and this fact, while it gives assurance that the constantly increasing growth of our country renders certain a constantly increasing home demand for the products of the dairy, and while the nature of the country itself precludes any great or extended competition, should at the same time stimulate those who have been so fortunate as to be in possession of the favored soil, to bring it up to its highest capacity, and make their staple products of the best and choicest quality.

As a top-dressing for grass lands, the application of gypsum, salt, ashes, bone-dust, lime, decomposed urine, well rotted manure applied in fall, composts of manure, river mud, road scrapings, or muck; each and all have a marked influence in promoting the growth of grass.

A more general use of bone-dust, it would seem, should be adopted, in order to return back to the soil the phosphates which are annually taken from it in considerable quantities by milch cows. So large an amount is there taken off in the milk of cows, and for the annual production of their young, that the use of bone-dust on the older dairy farms, it is believed, will soon become a necessity. Wherever employed as a top-dressing for grass lands, its results have been highly beneficial, and its application on dairy farms should be as universal as that of gypsum.

PLOWING AND RE-SEEDING.

From what has been said above, it will be seen that imperative reasons only, should impel the dairyman to disturb good permanent pastures, in the hope of improving them by breaking and re-seeding. Of course where they have failed, or are overrun with weeds, briars, and bushes, resort must be had to plowing

and re-seeding. It will be well then, to adopt some system that shall be thorough in its operations and lasting in its results. Let no more land be broken up than can be manured, subsoiled, and thoroughly tilled. If the breaking is to be done in spring, manure heavily on the sward, turn under and follow with subsoil plow.

The first crop most profitable for the dairyman will be corn, since the stalks, properly cured, make the best of fodder, and the whole crop can be turned to good account for stock. With the second crop re-seed. It is believed to be poor policy for the dairyman to exhaust his land by keeping it long under the plow, and in the raising of grain before putting down to grass. It is here that great mistakes are made, for the loss sustained by running the land to obtain several successive crops, will in the end prove to be much greater than is commonly supposed. From this cause, often lies the secret of poor meadows and sickly pastures—the soil has been overtasked, and needs rest and nursing until it has gained heart to make ample returns. Two crops of grain, at most, are all that good management would seem to authorize to be taken in succession from the soil, if the land afterward is intended to be employed profitably in grass.

The great object in view will be, to make a permanent pasture or meadow, and thus, by taking a few acres at a time, thoroughly manuring and cultivating it, the work is accomplished in that piece for years. A farm, under this system, may in a few years be brought up to a high state of fertility, and easily maintained and increased in its fruitfulness, without breaking in upon the main business of the dairy.

This course is to be preferred to that of disposing of the stock, plowing up large portions of the farm at once, and then getting back again to grass; for only a few acres at a time can with economy be properly manured, and the work will not generally be performed in that thorough manner as when the attention is directed to a smaller quantity of land, and to a more gradual but surer improvement of the soil. In re-seeding, some attention will be needed to have a greater variety of grasses than is commonly employed for putting down pasture and meadow lands. It has been shown that in rich old natural pastures, from twelve to twenty distinct species are found in the sod, and that the number of plants to the square foot are greater when there are several kinds intermixed.

Now the favorite grasses used for re-seeding by our farmers, are, for the most part, confined to timothy, the clovers and red top, and it must be evident other species can be added with profit. Of course the character of soil and climate must be studied, in reference to the adaptation of the several species, but a trial of a few varieties costs but little, while the results are likely to be of great value. Mr. Flint, in his excellent work on grasses, recommends, in seeding for permanent pastures, a mixture of the several species in the proportion, as stated in the subjoined table. This table has been re-arranged, and a second column added, in order to show the varieties and the proportions of seed in two tables, as recommended by Lawson & Son, of Edinburgh. "The climate of Scotland," says Mr. Flint, "in some respects does not differ from our own. The latitude of Edinburgh is 55° 57′; that of Boston 42° 21′, while the mean annual temperature of the former is 47° 1′ Fahr., that of the latter 48° 9′, showing a very slight difference. But our summers are hotter, and we are annually liable to the most severe and parching drouths, such as are not often felt in Scotland."

FOR PERMANENT PASTURE.

	1.—Lbs.	2.—Lbs.
Meadow Foxtail	2	2
Orchard grass	6	4
Hard Fescue	2	2
Tall Fescue	2	2
Meadow Fescue	2	2
Italian Rye grass	6	6
Perennial Rye grass	6	8
Timothy	4	3
Red top	2	2
Rough-stalked Meadow grass	3	2
Red clover	2	0
Perennial clover	3	2
White clover	5–45	5
June grass		2
Wood Meadow grass		2
Yellow Oat grass		1–45

The mixture in the second column is more expensive, but is preferred to that of the first, on the probability of its returning a better yield. Mr. Flint favors the idea that with a judicious

selection and admixture of species, permanent pastures and meadows of great value may be speedily obtained. The suggestion is worthy of consideration, and the foregoing table is introduced here with the hope that a trial may be made of a part or the whole of the varieties named. In laying down pastures and meadows, we have generally followed the usual practice of the country, and therefore have had no experience in sowing a mixture beyond three or four varieties of seed; but it has been long felt that this course was unsatisfactory, at least for pastures, where a variety of species, solid growth and enduring vigor are deemed of the utmost importance.

In closing this branch of the subject, it may not be out of place to briefly allude to orchard grass, and give the opinion of agriculturists, as to its great value as a pasture grass.

In the Transactions for 1859, Mr. Darlington, of Westchester, Pa., thus speaks of it:

"The usual rotation of crops in Chester county, Pa., brings each field, in its turn, into the condition of a *meadow* for the production of hay. The hay crop commonly consists, mainly of red clover and timothy. Those two plants afford a favorite and excellent hay, though the timothy is rather late in flowering. Some farmers prefer the orchard grass (Dactylis glomerata,) to the timothy, for the reason that the orchard grass flowers simultaneously with the clover, and both are ready to be cut the same time. Another recommendation of the orchard grass is, that when cut, the radical leaves speedily grow up, furnishing *aftermath* which protects the soil from the scorching summer sun; whereas the aftermath of the timothy crop is very deficient. Nevertheless, habit or prejudice induces the Chester county farmers, generally, to adhere to the culture of timothy." Judge Buel preferred it to almost every other grass. He says: "The American Cocksfoot, or orchard grass, is one of the most abiding grasses we have. It is probably better adapted than any other grass to sow with clover and other seeds for permanent pasture or for hay, as it is fit to cut with clover and grows remarkably quick when cropped by cattle. Five or six days' growth in summer suffices to give a good bite. Its good properties consist in its early and rapid growth and its resistance of drouth; but all agree that it should be closely cropped. Sheep will pass over every other grass to feed upon it. If suffered to grow long without being cropped, it becomes coarse and harsh. Colonel Powell, (a

late eminent farmer of Pennsylvania,) after growing it ten years, declares that it produces more pasturage than any other grass he has seen in America. On being fed very close, it has produced good pasture after remaining five days at rest. It is suited to all arable soils. Two bushels of seed are requisite for an acre when sown alone, or half this quantity when sown with clover. The seed is very light, weighing not more than twelve or fourteen pounds to the bushel. It should be cut early for hay."

Mr. Sanders, a well known cattle breeder of Kentucky, says of it: "My observation and experience have induced me to rely mainly on orchard grass and red clover; indeed I now sow no other sort of grass seed. These grasses mixed, make the best hay of all the grasses for this climate (Kentucky); it is nutritious, and well adapted as food for stock. Orchard grass is ready for grazing in the spring ten or twelve days sooner than any other that affords a full bite. When grazed down and the stock turned off, it will be ready for re-grazing in less than half the time required for Kentucky blue grass. It stands a severe drouth better than any other grass, keeping green and growing when other sorts are dried up; in summer it will grow more in a day than blue grass will in a week. Orchard grass is naturally disposed to form and grow in tussocks. The best preventive is a good preparation of the ground, and a sufficiency of seed uniformly sown. The late Judge Peters, of Pennsylvania,—who was at the head of agricultural improvement in that state for many years,—prefered it to all other grasses."

With this evidence of its valuable qualities, it is to be hoped that many will be induced to grow it on stock farms, adding other species also to the limited number now in use, and thereby promoting their own, and the country's wealth.

Where the soil of large fields has become exhausted or worn, and from this cause cannot be made to hold grasses permanently; and when manures cannot be had for their improvement, resort must be had to a succession of clover crops turned under, as perhaps the best means of renovating the soil. When in good heart, they may then be laid down in pasture or meadows, with a reasonable prospect of remaining permanent, and enduring, with proper care annually bestowed as to their treatment. This system of fertilization, is adopted extensively in Western New York, for holding the land good for grain crops, and with the best results.

Meadows should be made to yield annually at least two tons of hay per acre, and those that are not reaching that point, have some defect in soil, in grasses, or in their management, which should be studied, and receive that attention best adapted to the particular case in hand.

CHANGE OF PASTURES—OVERSTOCKING, ETC.

The practice, which obtains with some, of dividing the pasturage into separate fields, and changing the herd, every week or two from field to field, is now generally disapproved of by our best dairymen.

Cows confined to one field are more quiet and contented—they will usually go over in the course of the day every portion of the field, selecting their food, and when filled they lie down to rest, and *manufacture grass into milk.* All extra labor, excitement, and gluttonous feeding, from an over stimulated appetite, lessens the quantity of milk. Everything about the "every day pasture," is familiar, and if food is abundant they have no thought beyond leisurely taking their meals, and reclining at ease on some favorite spot, ruminating or dozing over their "*knitting work*," as Mr. Fish aptly terms it—no shadow of discontent clouding their peaceful, and seemingly happy existence.

But let a bite of grass in new fields be had, and all this is changed—they overfeed, and in consequence, their health is more or less deranged, they tramp round in every nook and corner of the field, in search of dainties—become restless or discontented, and not unfrequently some of the more active and enterprising members of the herd, try fences and make excursions into fields of grain and prohibited crops.

We have seen herds with one or two unruly disposed members, though perfectly quiet and orderly, while confined to one pasture, become so restless and discontented, from a change to new fields, as to be exceedingly troublesome, and to cause serious losses.

There are other reasons—the cost of building and maintaining a division fence, is a considerable item. The pastures too, will not be so uniformly cropped; large portions will get a rank growth, be rejected by stock, and therefore afford less nutritious food through the season, than when used as one pasture. Fresh pastures are more apt to produce scours, as is well known, deranging the appetite and health, to a greater extent than when confined to one field. The argument generally used, in favor of two pas-

tures, is that the daily tramping of the cattle on the one pasture renders the food less fresh and palatable, and that the alternate pastures obviate this, giving time for grass to grow, and thus producing more food and better results. The conclusion arrived at is not true in fact—stock when turned into a new pasture, do not rest until they have roamed over and examined every part of it, and will tramp down, soil and destroy more food than if the same land was in one pasture, thereby really affording or rendering available, a less amount of nutritious food during the season to the herd.

Cattle, it is true, like a change of food; but this change should exist in the varieties of grass, in the same pasture, and not in different fields. Of course the aftermath and gleanings from grain fields, are to be consumed by stock in fall, as deemed expedient, but the summer pasture should be one field, as productive of more milk, with less trouble, expense and loss.

Pastures, it is proper to say in this connection, should not be overstocked—the supply of food, must be abundant, otherwise serious losses will be incurred.

There is nothing gained by stocking clear up to, or a little beyond, the full capacity of the land, and trusting to an extraordinary good growing season to bring the animals through. Much milk will require a proportionate amount of food, and we have yet to see the cow miserly kept on scanty fare, that can turn *that fare* during the season into 600 or 700 pounds of cheese. The rule should be the largest quantity and best quality of dairy products per cow; and not the largest number of cows without thought or care as to the respective quantity or quality of milk from each.

Let this be illustrated a little more fully. The annual average quantity of cheese made by some of our dairymen has reached 700 pounds per cow; the average in the dairy of Mr. A. L. Fish, of this county, as has been given in the reports, was in 1845, 775 pounds per cow. At the latter figures, 30 cows would yield 23,250 pounds of cheese, which at 7 cents, amounts to $1,627.50. Now compare this with a dairy of 60 cows, averaging 400 pounds per cow, and we have 24,000 pounds, which at 7 cents comes to $1,680.00 or only $52.50 to balance against the 30 additional cows. The average of Mr. Fisher's dairy may be said to be an extreme point to reach, but the 400 pounds per cow in the larger dairy, is believed also to be more than the average amount real-

ised by a very great proportion of dairymen. What has been attained by one, can by good management, be realized by others. Of one thing there can not be much doubt, there is a faulty management somewhere, which demands correction, and it is the duty of every dairyman to study all the causes likely to influence or control the quantity, and quality of his dairy products, and try to reach the highest standard of excellence in all that pertains to his business. Let not the land then be overstocked; make ample provision for supplying food for a certain number of cows, and if the quantity of cheese in the aggregate is to be increased, let the poorer animals of the herd be selected out and sold, and their places filled by better stock, rather than adding to the herd culls and refuse cattle, and scrimping all in their food during a part or the whole of the season.

IRRIGATION.

As a means of improving meadows, or certain parts of dairy farms, that of irrigation, deserves some attention. An illustration of the advantages resulting from irrigation, is presented to the farmers of Herkimer county, in the annual overflow of the Mohawk river. The lands lying along the borders of that stream, in the towns of German Flats, Herkimer, Little Falls, and Manheim, have long been noted for their fertility. They were the earliest cultivated lands in the county, have been severely tasked year after year, have received little manure comparatively, but all manner of bad treatment, and yet retain remarkable fertility.

The character of the soil on these flats, it is true, differs from that of the uplands, being made up largely of alluvial deposits, but deprive them of their annual overflow, and they would to-day be far inferior to the rich slate lands of the county. Soils adapted to the dairy, abound in numerous streams and springs; and are so located, as to be often made available in irrigating fields, at but very trifling expense. A few furrows turned with a plow, might in many cases, on slopes and hill-sides, be made the means of irrigating large fields, by turning the water on or off at pleasure, at different points, simply by opening places along the furrows with a hoe.

It is not proposed to discuss the subject of irrigation in this paper, but merely allude to this means of fertilization by way of suggestion, in the hope that those who have fields lying in such a manner that the water from springs, streams, or marshy

lands, can be made available for the purpose, and at no great expense, may at least make a trial of its benefits. Numerous and well authenticated statements might be given, showing great and valuable results obtained by fertilizing fields by artificial irrigation, and thus increasing their productiveness. But the following from C. L. Kiersted, of Kingston, Ulster county, published in the Transactions of 1859, is deemed sufficient:

"I had," says Mr. Kiersted, about four acres of ground, mostly rock, with a soil averaging from six to two inches deep, and many places the rock was bare, lying on a slope, or sloping both ways, with a small stream of water running from a swamp through the lowest part of the lots; the land was in grass, produced about half a ton to the acre, I put upon it manure; it did no good; the grass when wet would grow, but would soon dry up and amount to mostly nothing. I took a team with a strong plow, plowed two furrows in different places so as to take the water from the stream over the highest land and let the water out whenever I desired it; attended to it twice a week, letting off and on in different parts of the lot. The result was about three tons of hay to the acre, cut early and a large after-growth. The next year took the water off, the result was less than half a crop. The year following let the water on again as before, with the same good results.

"I also had a piece of land, a coarse gravel, nothing but Johnswort grew upon it; there was a large spring directly above the lot; though the water running, as is mostly the case from springs, in a channel directly across the lot, I went to work as before stated, and drew the water upon the land; the result was, red top and herds grass came in and grew so that it lodged. Last year I mowed from one acre of ground 8,530 pounds of hay, timothy and white clover, made mostly by irrigation. I took the water from springs of *soft* water; drew it in furrows made with a plow; let the water on the land with a hoe. It should be attended to at least twice a week; the water never should be allowed to become stationary or stagnant. Let the water run in winter as well as summer. The expense of leading the water, when it can be done by furrow is scarcely anything—say two dollars per acre. The water should be taken off whenever the grass is becoming too weak to stand up, and soon after it should be cut."

WEEDS.

"Eternal vigilance is the price of freedom"—from weeds.

Dairy farming is no exception to the general rule—unceasing strife against the encroachments of weeds. Their march is ever onward, onward, and an unremitting warfare must be waged against them for the possession of the soil. The most troublesome weeds in the dairy districts of Herkimer, are ox-eye daisy, yellow daisy, Canada thistle, quack, wild parsnip, milk weed, burdock, elder, dock, dandelion, and in some parts of the county, sorrel.

There are others, and their name is legion, that infest roadsides, yards and cultivated lands; but the above, particularly the daisies, make inroads upon pastures and meadows, doing immense damage to those crops. Biennial weeds are easily destroyed, by not allowing the plants to go to seed; lime destroys sorrel; dock and parsnip should be pulled up when the ground is soft. Twenty-five years ago, the land here was divided up into smaller farms, with more landholders, and a greater effort was made to subdue weeds. Since then many of the smaller farms have been bought and added to the larger; and as farms increased in size, weeds have become more numerous, until it is not uncommon now to see whole fields in the possession of these pestiferous plants. It would be gratifying to be able to make a better report in this respect, from a region famed far and wide for her dairy products; but the facts will not warrant it. Of course there are a great many farms in the county (perhaps much the larger portion of the land,) that are entirely free, or comparatively so, from daisy. But the pest moves on; it has, perhaps taken possession of the adjoining farm, and then there is a fierce struggle for a few years, pulling up and digging out weeds; but the many myriad seeds,

"Bestride the winged gales,
And sailing upon the bosom of the air,"

drop down in pastures and meadows, in such numbers that the farmer becomes discouraged, or resorts to the scythe to keep them in check.

The following table may, perhaps, be interesting, as showing the vast number of seeds annually produced by a single plant, as well also as what is to be contended with when these pests are suffered to mature their seeds. The botanical and common names are given.

Botanical name.	Common name.	Number of seed vessels or flowers to each plant.	No. of seeds to each vessel or flower.	No. of seeds to each plant.
Rumex obtusifolius	Common dock	13,000	....	13,000
Arctium lappa	Burdock	613	40	24,520
Chrysanthemum leucanthemum	Ox-eye daisy	45	300	13,500
Matricaria chamomilla	Mayweed	150	300	45,000
Leontodon taraxacum	Dandelion	12	170	2,040
Heracleum sphondylium	Cow parsnip	2,500	2	5,000
Sisymbrium officinale	Common hedge mustard	450	12	5,400
Pastinica sativa	Wild parsnip	600	2	1,200
Sonchus arvensis	Com. sow thistle	100	190	19,000
Sinapis arvensis nigra	Black mustard	200	6	1,200
Stellaria media	Chickweed	50	10	500
Senecio vulgaris	Groundsel	130	50	6,500
Papaver rhoeas	Red poppy	100	500	50,000
Capsella pursa pastoris	Shepherd's purse	150	30	4,500

The Canada thistle is not considered very injurious to meadow lands. Stout grass soon runs them out, but in pastures they are more troublesome. When cut down before the seeds mature and stalks hollow, they are not unfrequently destroyed; the application of salt, too, about the plant and in the hollow stalk of the stubble, helps the work of decay and destruction. But the daisy is more difficult to subdue. Plowing and thorough cultivation for two or three seasons will clear the fields. This, however, is not always convenient or practicable, without breaking up, for the time, the dairy. Manuring heavily and plastering are, perhaps, the best means of getting rid of this pest, where they have got a foothold in patches, and are too numerous to be pulled out by hand. Make the grass grow, put on the manure, ashes, salt, gypsum, and if the grass is thin, sow seed; but above all spread on the manure and plaster; they do not like it, while the grass does, and they are choked out. By this means three objects are attained—improvement of the soil, more grass, and the destruction of one of the most insufferable pests on dairy farms with which we are acquainted.

Many farmers assert that daisies, when cut early, make good fodder; that cattle are fond of it when mingled with hay, and will winter well on such feed. But the plant occupies too much ground, makes little fodder, and is altogether too expensive. Daisy pastures give a bitter taint to the milk, which is perceptible in the cheese, so much so, that some of our most experienced

cheese buyers affirm they can distinguish the daisy farms of the county from samples of cheese at the depots. Some affirm, and instances are given, where daisies have run out or disappeared from lands, and even roadsides, of their own account, no effort being made to destroy them beyond early cutting—the means usually resorted to for keeping them in check and making the most out of this kind of fodder.

In some of the States, and in Europe, laws are passed making it obligatory on the part of landholders, under penalties more or less severe, to destroy certain noxious weeds. This is believed to be wise legislation: for many a man has a large amount of labor and loss annually entailed on him, by the neglect of neighbors in the destruction of weeds, which, in the first instance, were so inconsiderable, as to have been overcome in a few hours. Weeds are unsightly objects—they mar the good looks of a farm; they are gross feeders, and occupy a considerable portion of the soil, to the exclusion of other crops; they taint the products of the dairy, and a united effort among dairymen should be made to exterminate *those*, at least, *of the worst character*. Might not agricultural societies distribute pamphlets, giving the names and drawings of our worst weeds, and the best means of extermination? Or, premiums might be offered for their successful extirpation, and accompanying statement of the means adopted.

RAISING GRAIN.

Many years ago, it was considered good economy for the farmer to produce on his farm nearly every article needed to supply his wants. More recently, the tendency has been to make one or two articles leading staples in certain localities, as productive of more wealth than the mixed farming of former years.

Some difference of opinion exists, among dairymen, in reference to grain raising, many insisting that all the grain needed should be grown on the farm, in connection with dairy farming. Our best dairymen, however, do not generally advocate the system, beyond what is necessitated from a judicious rotation of crops. Flour, therefore, and much of the grain fed to cattle, are imported from grain growing districts. Meadows and pastures that need breaking up and re-seeding from time to time, will be employed in grain raising; but, to break up a good pasture or meadow, that is yielding well, for the purpose of "plow land," or getting a crop of grain, is believed to be poor policy. Wheat and oats, at

best, are not the most profitable crops in dairy districts, and can generally be purchased cheaper than can be raised.

Compared with the production of hay, these crops will stand thus:

One acre in hay—two tons, at $10 per ton	$20
Deduct cost of harvesting	3
	$17
One acre in wheat—say 20 bushels, at $1	$20
Deduct seed $2, fitting land, sowing, &c., $5	7
Harvesting and threshing to balance straw.	
	$13
One acre in oats—40 bushels, at 40c.	$16 00
Deduct seed 80c., fitting land, &c., $5	5 80
Harvesting and threshing to balance straw.	
	$10 20

Making balance in favor of hay, and against wheat, of $4; against oats, of $6.80.

These grain crops are subject, more or less, to accidents, and are more uncertain than grass; hence, the average annual returns would be rather less than above the estimate made.

Corn and barley will compare better, and are more profitable for the dairyman, since the stalks and straw of these grains are valuable for fodder, and the average annual product of grain, will be worth much more than that of the other crops.

It will be well to have some system of rotation, adapted to the soil and farm under cultivation, thus bringing every part of the farm into grass again, at intervals of 10 or 15 years.

If five acres of sod be broken yearly, and five acres be put down to grass, ten acres will be annually under the plow; which, for one hundred acres, would give meadows of ten years' standing. Under such a system, it will be seen, the land could be thoroughly cultivated and enriched, and made to produce large returns in both grain and grass.

ROOTS.

To the dairyman, the importance of growing roots, for stock feeding, cannot be over-estimated.

In an economical point of view, as a mere substitute in part for hay, roots will hold a high place, being among the best and cheapest of all foods, for the winter and spring feeding of cows. But, beyond this, lies another and by far the greatest advantage to the dairyman: their influence in preserving the health of stock. This point is too frequently overlooked by those who have the care of milch cows.

Perfect health is as essential to the animal, in order to get the best results in the dairy, as perfection in the running gear of machinery, for producing good work. This cannot be too often, nor too strongly, urged upon the attention of dairymen. The cow should be regarded as a delicate piece of "organic mechanism," whose use is to convert food into milk, and everything affecting the health or well-being of the animal, influences, more or less, the quality and quantity of material which she manufactures. A sickly cow can not be expected to be the source of the highest profit.

Whatever the cow eats is sooner seen in her milk than in her flesh, since this is one of the outlets which nature gives her for throwing off disease, and casting out impurities of the system, resulting from bad or decayed food and improper treatment.

The microscopic examination of milk, from animals confined in cities, and whose food consisted largely of distillers' slops and other vegetable garbage, has shown it to be in many instances a reeking mass of putrescence—pus, diseased emanations and milk mingled together, forming a filthy compound, very deleterious to the health of the consumer. The same general principles hold good everywhere. If the cow eats food that is medicinal—that has a disagreeable odor—that in any way affects health, it comes out in her milk. Hence the greatest attention should be given for preserving the health of animals during the winter and spring, in order that they may be prepared to yield the largest quantity and best quality of milk. We hold it to be almost among the impossibilities, for a cow to be kept six or seven months on the imperfect quality of hay ordinarily provided for her use, and without other food, and retain a high state of health. She may be in flesh, but flesh is not always health, and hence the frequent cause of innumerable ailments that break out in spring—"coming in poorly," horn-ail, soak tail, garget, fever, lassitude, and other diseases of stock, well known to dairymen.

A judicious feeding of roots through the winter has a wonder-

ful efficiency in preserving the health of animals, and no one who hopes to realize an annual average of from 600 to 700 pounds of cheese per cow, from his herd, should neglect to make ample provision of this kind of food. Carrots and mangold wurzel are deemed among the best roots for milch cows; turnips impart a disagreeable flavor to dairy products, but may be fed with profit in winter, when the animals are not in milk. The mangold remains juicy and palatable for a long time; it contains nearly two per cent of flesh-forming ingredients, and upwards of eleven per cent of heat-giving substances, and from experiments made, it appears that the addition of half a bushel of Mangold, morning and evening, to cows pastured and fed with hay, produced an increase of thirty quarts of milk in a week. When the ground is properly prepared, and the plants thoroughly cultivated, a thousand or more bushels of carrots or mangold can be grown to the acre. The carrot is a very sure crop, and on some accounts is perhaps to be preferred for the dairy. As many as 2,000 bushels to the acre of this root have been grown by the application of special manures and extra cultivation. Boussingault estimates the relative nutritive value of hay and carrots to be as one to two and a half, or twenty-five pounds of carrots as equivalent to ten pounds of hay.

Assuming that 1,000 bushels of carrots can be raised on an acre, we have an equivalent for twelve tons of hay. But when the better health of the animal is taken into account, as well as the increased production of milk, and its better quality, it will be seen that the importance of growing this kind of food for the dairy has not been overdrawn.

One word as to the cultivation of carrots: They like a deeply cultivated and well pulverized soil, enriched with rotten or well decomposed manures, and must be kept free from weeds. We have grown good crops with little or no trouble from weeds, by manuring on sod, turning under and deeply subsoiling the land; they are raised this way very cheaply, and in fall, by running a plow along the row at the side of the plants and bending them over, may be rapidly pulled and gathered.

IMPORTANCE OF GOOD STOCK.

Having all the means at hand for producing food in excellence and abundance, the next step will be the selection of a good dairy stock; and it will make no particular difference as to breeds, so

long as animals of sound constitution and large milking capacity be obtained.

Among the blooded stock, the Ayrshires hold a deservedly high reputation; and next to them, perhaps, the Durhams are more in favor; the Durhams are large, and some families of the breed very excellent milkers, but they have been bred more in reference to beef, than great milking qualities, and hence grade cattle are not unfrequently preferred for the dairy. Instances could be pointed out, in this county, where an effort was made to keep the blood pure, the stock became very inferior for milk, and resort was had to the native cow. Much has been said and written in favor of the superiority of pure blooded animals for the dairy, but it is a question whether they are any better, or even as good as our best native cows. It is said the Cheshire dairies in England average 336 pounds cheese per cow, and from selected cows 560 pounds, and yet we have numerous examples in Herkimer county, where a herd of native cows, sprinkled perhaps here and there with grade cattle, have produced an annual yield of more than 600 pounds per cow.

As an instance of the capacity of some of our native cows, the Oaks cow might be instanced. Hon. Zadock Pratt, in an address before the Greene county agricultural society, thus alludes to this cow. He says: "In the agricultural journals I have read an account of a middle sized country cow (I refer to the celebrated Oaks cow,) bought out of a drove in Massachusetts for a mere trifle. Her history illustrates two things worthy of notice: First, what we can obtain from the best of our old breed; and secondly, how much depends on good feeding." * * "It is stated on the most unquestionable authority, such as satisfied the Massachusetts Agricultural Society, that in the first year, with ordinary keep, she made but 180 pounds of butter. The next year she had twelve bushels of corn meal, and then gave 300 pounds of butter. The next, she had thirty-five bushels, and gave more than 400 pounds. The next year she had a bushel a week, and all her own milk skimmed, and then she gave, from the 5th of April to the 25th of September, the day of the show, 480 pounds, besides suckling her calf for five weeks. She was exhibited, and deservedly took the premium on the last mentioned day, and will carry down her owner's name with credit to posterity as long as *Oaks* grow.

"In the Transactions of 1849, I find the following record of remarkable cows of this country."

These are cows for the butter dairy. It would be interesting to have statistics showing the capacity of individual cows for producing cheese; but the manufacture of that article precludes experiments of this kind, except at a loss. When the average is made of a herd, it is evident the poorer animals are credited with more, and the best with less, than the amount produced by each.

Date.	Name.	Place.	Weekly produce.	Length of time.
1826	Oaks cow	Danvers	16 pounds.	16 weeks.
1824	Nourse	do	14 do	16 do
1828	Sanderson cow	Waltham	14 do	16 do
1830	Homer's	Bedford	14 do	12 do
1830	Hazeltine	Haverhill	14 do	12 do
1830	Bassett	Northampton	14 do	12 do
1845	Buxton	Danvers	16 do	12 do

"John Hase Powell, of Pennsylvania, from a Short-horn cow, in three days produced 8 lbs. 3 oz. butter.

"George Kerr, Ontario county, N. Y., from native cow, 19 lbs. butter in one week, and 16 lbs. for two succeeding weeks.

"T. Comstock, Oneida county, N. Y., from three-fourths native and one-fourth Durham cow, 17 lbs. 5 oz. butter in one week.

"C. D. Miller, Madison county, made in one week from a cow, 20½ lbs. butter.

"G. A. Mann, Onondaga county, made 67½ lbs. butter from the milk of one cow in 30 days.

"P. H. Schenck, Dutchess county, made 15 lbs. butter per week from a polled cow, and in 21 days 65½ lbs. of butter."

Now it is evident that cows of this character are not to be readily picked up from droves, or from the culls of dairies got together and offered for sale, since no one owning a good cow will willingly sell her at the ordinary market price. If a dairy is to be started, it would be better to pay double the market price for a really good cow than to buy a poor one at any price, and having once established a good herd, to commence breeding in order to supply the places of those worn out by age or failing from other causes.

The selection and possession of the best cows the country affords, should be the ambition and leading object of every dairy-

man. It is one of the pillars of his success; for, no amount of food, care or treatment, can get the best results from poor and worthless stock.

The practice of buying any and everything that is offered for filling up dairies, cannot be sufficiently deprecated; it is labor, time and money thrown away—worse than wasted—since it exerts no influence for improvement, but induces whole communities to drag, year after year, in toil and drudgery, without much compensation beyond a bare living, and the annual expenses of the farm. It paralyzes, also, all laudable endeavor in other branches of the dairy, because every dollar for improvement is felt to be more than can be afforded, and promising no ample return. Poor stock is the curse of dairy farming, and should no more be suffered to harbor on the farm than any other unmitigated nuisance, whose influence is bad, or destructive to the best interests and well-being of the individual and society at large.

RAISING STOCK.

The great difficulty in obtaining superior milch cows to supply the many and large herds in a dairy district, will render stock raising desirable, at least, with those who are striving to excel in quantity and quality of dairy products. Our best dairymen have long felt, that the only reliable way of getting large returns, and maintaining superiority in this respect, from the herd, is to raise and educate the animal on the farm, and under the eye of the dairyman. Grade cattle, from good milking families of "Short horns," are regarded with favor by many, on account of size. A cross of Durhams and Ayrshires, is also in high esteem, as productive of all the milking qualities of the Ayrshire and an improvement in size from the Durhams.

The Ayrshire blood, it is believed, will prove of great value in American dairies, but whatever stock is in favor, the breeding should have particular reference to milk.

The principle of like producing like, will generally hold good in breeding for the dairy, hence great attention should be had to breed from good milking families, and the parents on both sides should be from stock noted in this respect. Guenon's method of determining the value of an animal for milk, from the escutcheon or "milk mirror," should be studied and understood, and will be of aid in the proper selection of stock for the dairy.

As the production of milk in large quantities is more or less

exhausting, sound constitution and health are points also to be considered, and an old or feeble cow will not be likely to breed as vigorous stock as younger animals in high health. Mr. Finlay Dun, in a prize essay on the hereditary diseases of cattle, published in the *Journal of the Royal Agricultural Society of England*, enumerates diarrhœa, rheumatism, scrofula, consumption, dysentery, malignant tumors, and the affections depending on a plethoric state of the body, as the most important hereditary diseases of cattle. Among others, he gives the following characters which cattle should possess, in order to perpetuate in their offspring a healthy and vigorous constitution :

"The head small; muzzle firm and tapering; nostrils large and open; the eyes full and lustrous; the ears small, and not too thick; the head well set on the neck; the distance between the ears and the angle of the jaw short, but the width behind the ears considerable (no dairy cow should have a short thick neck); the chest wide and deep; the girth, taken immediately behind the shoulder, should closely correspond with the length from behind the ears to the rise of the tail; the carcass of a barrel-shape, for a thin flat-ribbed animal eats largely, thrives badly, and is usually liable to diarrhœa; there should be little space between the prominence of the hip and the last rib; the quarter large; the measurement from the prominence of the haunch backwards to the rise of the tail, and downwards to the hock, as great as possible; the lower part of the haunch thick and broad; the hide thick and pliant; smallness of bone is a sure indication of early maturity and aptitude for fattening. These, among other characters and qualities enumerated by Mr. Dun, indicate the possession of a vigorous and healthy constitution, and freedom from all inherent disease."

The calf, too, must have generous feed, and good care and treatment, in every respect; for a scrubby, dwarfed and pinched calf cannot be expected to mature into the best cow; care must be taken that it be not over-fed, so as to become dainty, but kept in a healthy growing condition.

Extra feed should be given during the fall, when grass is scant and of poor quality.

Roots, oatenmeal, and the best of early cut hay, fed regularly during winter, with well lighted and well ventilated stables, all will amply repay the breeder, in the better size, condition and prospective value of the animal for the dairy.

The education of the animal for the dairy, is also of importance. Docility, good temper, quietness, all of which are necessary in a good milch cow, are the result, in a measure, of kind treatment and early education.

Many a fine animal has been irreparably ruined by coarse and brutal treatment, for no cow that trembles from fright, or exhibits great nervousness, during milking, will yield her greatest capacity of milk. Calves, from the first, should be daily fondled, and made familiar with persons; never frightened or worried by dogs, beaten, or cruelly treated. They should have no fear of their attendants, but rather express pleasure in their presence, and a willingness to be petted and handled; and when the heifer comes in milk, the utmost kindness and tenderness should be shown in her management, until the animal is thoroughly broken and shows no more nervousness at being milked, than in the suckling of her own calf. Heifers that have been well kept, will begin to come in milk, at two years' old, and are regarded as making better cows than when coming in milk at a later age; since the capacity of cows for giving milk is varied by habit, and an early development in this respect stimulates the secretions of milk, and, as found by experience, is productive of better results.

MILKING, SALTING, &c.

Regularity in milking, and good milkers, are as necessary to success as good management in any other branch of the business. On this account, none but careful and experienced hands should be employed. The milker, having selected his cows, should study their character, and be careful not to get their ill-will, for an animal that dislikes her milker will not be likely to give down all her milk, and soon begins to deteriorate—her capacity for milk growing less and less. Cows, also, do better that have one steady hand in attendance; and, therefore, the milker should not be continually changing from one set of cows to another. Let it be plainly understood that no harsh language, striking with stools, nor unkind treatment of any kind be had toward stock, and an infringement of this rule is to discharge the offending party on the instant.

It will make a much greater difference than is commonly supposed, to have the animals kindly treated, leisurely driven from the pasture, and thoroughly milked, than where no attention is given to these matters. A careless, poor or slovenly milker will

soon do great injury to stock under his care. After commencing the work, the udder should be rapidly emptied—breaking off to change pails, to carry milk, or delay of any kind while milking, is injurious, for where a break of this kind occurs the animal will not give down all her milk for that time, and no coaxing will induce her to do so.

Regularity as to hours is also important in milking, and an equal division of time should be made, say at five o'clock morning and evening, and each animal to be milked in regular order—the last cow milked in the morning being the last at night. But, whatever hour be fixed upon should be punctually regarded, since otherwise the secretion of milk in the udder will be irregular.

It will be remembered that the last milk drawn is the best, and that if any of this be left in the udder, there is not only a loss in quality and quantity, but the cow soon degenerates into a second or third rate milker.

Cleanliness should be insisted upon, as milk is easily tainted, and will impart that taint to the products manufactured from it. If the teats be cracked, or the udder feverish, bathing in cold water and oiling the teats, after milking, with whey butter, will soon remove the difficulty.

The following from a writer in the Boston Cultivator, is so much to the point, and states so truthfully what is too often overlooked by dairymen, with regard to milking, that it may not be out of place to quote. He says:

"When I first commenced farming, I milked all my cows with my own hands; and, the result was, no one in town could boast of having made more butter, according to the number of cows, than we. I well remember of having a very noble cow for milk, which would fill a twelve quart pail twice a day; and that a friend while visiting us was anxious to milk her. As I was well aware of the bad results of permitting a poor milker to milk cows that are accustomed to be milked by one faithful, regular hand, I unwillingly consented that he might milk her. The result was, that he obtained about one quarter less milk than she was accustomed to give; and, although I tried faithfully to draw more milk after he had finished milking, my efforts were in vain; and it was several days before I could obtain from her the amount which she was accustomed to give. My manner of milking was to milk as fast as possible until a cow was milked

entirely clean. I was obliged at one time to stop milking only a few minutes, and I found that the cow had drawn up her milk, and I could not get it that evening. This taught me the importance of employing one steady, regular hand at milking."

Prof. Johnson, also, truly observes that "A state of comparative repose is favorable to the performance of all the important functions in a healthy animal. Any thing which frets, disturbs, torments, or renders it uneasy, lessens the quantity and vitiates the quality of the milk.

"Such is observed to be the case where the cow has been recently deprived of her calf, when she is taken from her companions in the pasture, when her usual place in the cow-house is changed, when she is kept long in the house after spring has arrived, when she is hunted in the field or tormented by insects, or when any other circumstance occurs by which irritation or restlessness is caused, either of a temporary or permanent kind. I do not inquire at present into the physiological nature of the changes which ensue; *to the dairyman it is important chiefly to be familiar with the fact.*"

Salt.—Milch cows should at all times have access to salt. Salt is necessary for the preservation of health, and the want of it for any length of time has a controlling influence in lessening the quantity and affecting the quality of milk. When placed in a trough, where it is easily accessible, the animal takes it in small quantities and as needed, and is not injured from an overdose as is often the case when it is dealt out at stated intervals.

LIGHT AND VENTILATION.

A mistaken notion prevails with many that animals need little or no light while confined in stable. Physiologists declare that, other things being equal, families that occupy apartments in the sunny side of dwellings are the most healthy and happy. Fresh air and sunlight are promotive of health; and yet, in the construction of stables for animals, many seem to forget that these requisites are important.

One would suppose that in localities where the attention of farmers is almost exclusively devoted to stock, everything connected with the management of animals, conducing to their health and comfort, would be the subject of thought. Yet, how few even for a moment are willing to give this subject the attention it deserves. To suppose that an animal, confined in a dark,

damp, unventilated stable will thrive and be able to yield the same profit that it would if occupying a place the reverse of this, is to suppose an impossibility. Disease, though it may not at first be apparent to the eye, is nevertheless doing its work, and in some way will make itself felt to the loss of the owner. On the score of economy, we believe that it pays to treat all animals kindly, and to provide them with suitable buildings for shelter. We know, from actual experience, that the cow that has been wintered in a warm, dry, well ventilated stable, properly fed and cared for, will pay for all extra trouble and labor in the increased quantity and better quality of milk, yielded through the summer following. When we hear dairymen complaining that the annual yield of cheese per cow has fallen down to 300 or 350 lbs., we have strong suspicions that the fault lies somewhere in the keeping or management of stock.

We hold that a good stable for stock should be provided with windows to admit sunlight; it should be dry and well ventilated, and the same general rules for health, applicable to persons, should be ever before the farmer, and guide him in his treatment of stock.

ABORTIVE COWS.

In my article in last year's Transactions, some facts were given in reference to the comparatively new habit of abortion among herds of milch cows in some of the northern towns of Herkimer.

The opinion has prevailed here to some extent that the causes producing this disease resulted from a lack of phosphates in the soil. As the habit had shown itself only on the older dairy farms of the county, where considerable quantities of this substance must have been extracted from the soil, and carried off in dairy products, and not returned, the reasons adduced seemed to have some foundation. But, on farms where the trouble was severely felt, and where resort was had to turning off the entire herd, and introducing new stock, no cases afterward have as yet occurred. The subject is again alluded to in this paper, because during the present season the habit seems to have shown itself with great virulence, in different localities in the county, to the loss of very considerable portions of herds; and from inquiries, it is believed, the habit is wide-spread and more general than was at first supposed.

The dairymen of Herkimer are as yet unable to point out the causes for the sudden appearance of this disease in certain localities and on isolated farms, and the only successful means known for arresting the habit is the one alluded to above, viz: disposing of the old herd, and filling their place with an entire new stock from a disaffected locality.

As facts are important in reference to diseases that make their appearance from time to time, the causes of which seem shrouded in mystery, the following from Mr. D. B. Hinman, of Highfield farm, Westchester, Pa., is deemed worthy of note. The facts were presented to the Farmers' Club at this place, in reply to letters of inquiry, with regard to the habit in the locality of Westchester. Mr. Hinman hails from one of the best dairy districts of Pennsylvania, and is favorably known by reputation to many of the farmers of this State. He says:

"A herd of thirty cows, within about one mile of the borough of Westchester, became abortive during the spring. Whilst these cows were taking the bull, a number of persons keeping one cow in the borough sent them to this farm to be served; in every instance the cows aborted. None of them had done so before, and have not since. This was three years ago.

"It is now about four years since this theory was first broached. Every one ridiculed it, but the cases have become so numerous, that most of those who have an opportunity to see its effect, fully believe that when a bull serves a cow that has aborted, and whilst her organs of generation are still much diseased (which is usually the case), he will communicate the disease to a cow that he may serve, within two or three days after he served the abortive cow, and some contend that he will do it within two or three weeks after.

"We have so many instances where cows have been served by bulls running with abortive cows, that very few in this neighborhood will suffer their cows to be served by such bulls.

"The theory is, that the diseased state of the cow affects the bull, somewhat like the venereal complaint in the human species, and he produces in the cows he serves a slow inflammation which results in abortion.

"If you will observe this thing closely, I have no doubt but you will find the same results with you. We do not believe that a bull that has not served a cow for several months can communicate the disease.

"We have frequent cases where cows have become abortive, and the whole herd, bull and calf, sent off and sold; such cows find their way to Philadelphia, and are sold for what they will bring. The farmer will then make up his number by purchasing such cows as he can find that suit him, within a circuit of a few miles, *when for years no case of abortion will appear*, many of these cows having been in the neighborhood for years, and on dairy farms.

"We do not believe it is from anything they eat, or from anything they drink, or for the want of anything they do not eat.

"The theory of many farmers in this neighborhood is, that the case of abortion is usually produced by accident, by slipping, falling, or being driven by master cows, or something of the kind, and subsequently cases arise from mere *sympathy.*

"When a cow drops a calf (which will sometimes happen among the most careful) in the barn-yard, and at her full time, no notice appears to be taken of her by the other cows—they will mostly withdraw and leave her to herself. But when an abortion takes place, you will generally find it quite different; more or less excitement is manifested, and sometimes very great excitement, even to bellowing and pawing, as if something frightful had happened, and they seem anxious to smell of the dead calf.

"If this theory is new to your dairymen, I think if they will observe closely, they will discover good grounds for adopting it."

In a subsequent letter Mr. Hinman writes:

"I find that the theory of abortion being produced by what the cows eat, or for the lack of something they do not eat, has few if any advocates. Against this theory some reason thus: They say, as a general thing, we have no meadows and pastures, as such—on most farms every field is plowed in its turn, or when its condition seems to require it. Farms are usually divided into ten to twelve fields, and it is a rare case that more than three fields are under the plow at the same time. We have almost uniformly a field of corn, one of oats or barley, and one of wheat. Plowing up a sod, say this spring, and planting with corn, next spring with oats or barley, and next fall it receives in *most cases* the winter manure of the farm, sowed with wheat and timothy and clover in the following spring, and if the field had not received a coat of lime whilst lying in grass, it receives from 50

to 100 bushels of lime on the inverted sod before the corn is planted. Under this system it is claimed that our farms furnish everything necessary to enable our cattle to produce healthful offspring. We have repeated evidence of the same character as before presented, *so that a bull that has served abortive cows is as much damaged for all practical purposes as the cow that has aborted.*

"I feel quite sure that the more your dairymen examine and watch this theory, the more thoroughly will they be convinced of its truthfulness.

"How long after aborting the cow will cease to disease the bull, we cannot tell; how long after the bull has served an aborting cow will he cease to communicate the disease, we cannot tell.

"With us it is the most rational theory to our minds we have, and until something more satisfactory is presented, is likely to remain so."

DAIRY HOUSE.

The construction of the cheese room, and its proper temperature for curing cheese in the best manner, seems to be but imperfectly understood, even by our best dairymen. Not sufficient thought or attention is given the subject by the generality of farmers, although more or less faulty cheese, on many of our dairy farms, is the result of improper curing in damp, badly ventilated and ill-constructed cheese rooms.

When the weather is favorable, there will be no great difficulty in curing cheese in any ordinary room where it may be kept. But in damp, cool or rainy weather, without artificial heat, or ventilation, fermentation is disturbed, the cheese not unfrequently becomes sour, mouldy, contracts a bad flavor, or is so injured that no after-curing will be able to counteract evils thus acquired and bring it back to first quality cheese. Extreme heat also has an unfavorable influence; then fermentation often goes on too rapidly—the cheese swells, and is rendered porous, or sweats away, and loses a portion of its oily particles.

In the construction of curing rooms, some of the points to be regarded are, that the room be not damp, nor too dry; that the light be so arranged as to exclude the sun shining on the cheese; that currents of air be not allowed to strike the cheese; means of ventilation, whereby gases arising from fermentation be carried away; and finally, control of temperature. A low and even

temperature, ranging from 70° to 80°, is regarded as most favorable for obtaining mild and pleasant flavor.

The precise temperature best, will depend somewhat on the manner of making the cheese, and the quantity of salt and rennet used. Heat, rennet, salt and moisture, will give character to the cheese in curing. From experiments made by Mr. Fish, the following principles are deduced:

"High salting and heat, making hard, smart cheese; low salting and heat, soft, mild and tasteless; low salting and high heat, porous, soft and sharp; much rennet and little salt, cheese huffed, ran oil, became rank, and spoiled; little rennet and high heat, sour, dry, hard and smart."

But whatever be the style of cheese, if uniformity in making is maintained, it will be best cured in an even temperature.

Too much air on the cheese, or the rays of the sun, has a tendency to dry the cheese too fast, to lessen its weight, and make it crack. Too much heat, has a tendency to extract the butter and produce huffing. But when kept in a moderate and even temperature, with ventilation sufficient to carry off the gases arising from fermentation, and are neither so dry nor so damp as to render them mouldy on the outside, and no under fermentation is excited, the best results are obtained.

In the plan for dairy house herewith presented, economy, simplicity and convenience, have been studied, together with advantages, it is believed, for controlling temperature at pleasure. A lower room for curing cheese, if desired, can be arranged on the same principle, and on some accounts is to be preferred, but it would be more expensive, and less convenient in other respects, than an upper room for this purpose, while the advantages gained would not be so great as to make it of much importance:

A building 24 feet by 30 feet, story and a half high, will be large enough for an ordinary-sized dairy. Light is to be admitted only on the north and south sides, as less liable to let rays of the sun fall on cheese. The lower part is divided into room for making cheese, 12 by 14 feet; milk closet or store room, 10 by 14 feet; the balance, wood house, 16 by 24 feet. A piazza runs along the sides of the closet and room for making cheese, rendering these parts cooler in summer, and affording a convenient place for drying dairy utensils, &c. The upper part of building, the cheese-curing room, 24 by 30 feet, 8 feet high, studded and

lathed and plastered. A ventilator runs from ceiling, in centre of room, above the roof, and terminating in usual form, with arrangement at ceiling for closing draft entirely, or conducting off larger or smaller quantities of air, as desired.

Air is admitted under the roof (where it joins the sides of the building) into the garret, so that by opening slides inside the ventilator, above the ceiling, a current of air may be maintained in the garret part. Openings, with wickets, are placed at the bottom of the room, and along and through the sides of the building, to the open air—three or more on a side. These openings are 10 inches by 20 inches; the wickets close tight or admit more or less air, as desired, at pleasure. An ice reservoir, or refrigerator, on rollers, sets in the room, in which ice may be exposed, if necessary, in extremely hot weather. A good air-tight or coal stove; tables, 4 feet wide, of *hemlock*, and not painted, for holding cheese; thermometer and platform scales. These are the general features of the dairy-house suggested.

The building, it is proper to say, should not stand where taints are likely to be absorbed by milk or cheese. The whole will be better understood by the accompanying cuts.

DAIRY APPARATUS.

An opinion prevails with many, that the operations of cheese making can be conducted as successfully without as with the use of the thermometer, the curd knife, and the vats and heater. That is, that the heat for setting the milk and scalding the curd, can be ascertained, near enough for all practical purposes, by immersing the hand and guessing at the right temperature; that the curd may be broken with a blunt instrument, or with the hands; that a part of the milk may be heated to a high temperature for the purpose of warming the rest, and that a portion of the whey also, may be thus heated for cooking the curd.

We believe that very great losses result to those who persist in this course of dairy management; for no one will be able to judge accurately at all seasons of the year, or under the various circumstances to which the hand is exposed, by heat or cold, immediately preceding the time for testing the milk or whey. Much injury is done to cheese by having the milk too hot at the time of setting or adding the rennet. At about 88° to 90°, is deemed by the best dairymen as the highest heat to which milk should be subjected for this stage of the process of cheese making —a higher heat being almost invariably attended with loss in quan-

tity as well as in quality of the cheese. So, with the mass at scalding, 100° being the maximum heat for properly cooking the curd.

One part of the great art of making good cheese, and the most from a given quantity of milk, is, that the milk be so managed that the curd shall consist of the greatest amount of the casein, or cheese proper, of the milk, as well as that of the butter.

The observation and experience of our best dairymen, go to show that milk kept at a low temperature, makes the best cheese, whether the milk be new or old. The practice of heating a part of the milk very hot, for the purpose of warming the rest, is neither economical nor convenient. The effect of heating milk, is to hasten the ascent of the butyraceous matter.

When a portion of the milk is heated very hot, there will be a scum formed on the top, and in cooling, the butyraceous matter of the milk rises rapidly, and is near the surface; the caseous parts are below, and the oily globules are not imbedded in the casein, in the same uniform manner as when the milk has not been subjected to high heat.

After the rennet is added, a further cooling of the mass takes place before coagulation is perfected, and the butyraceous matter rises still more towards the surface; and the consequence is, that the upper surface of the milk will be rich in oily matter, which high heat has set free, with too small a quantity of casein, and as rennet acts exclusively on the casein, this butyraceous or oily matter will not readily work in with the curd. Sometimes there will be a thick coat of cream on the curd, and it will be impossible, as every dairyman must have observed, to work this in the curd in the same manner as if it had been imbedded in the caseous particles and coagulated with the rest of the milk in the same uniform manner as when originally suspended. This is one reason why injury and loss are sustained in heating milk to a high temperature; so in heating a part of the whey for cooking the curd, it is unevenly cooked and much more labor is required. There are other reasons which we deem important, but which need not be discussed at this time.

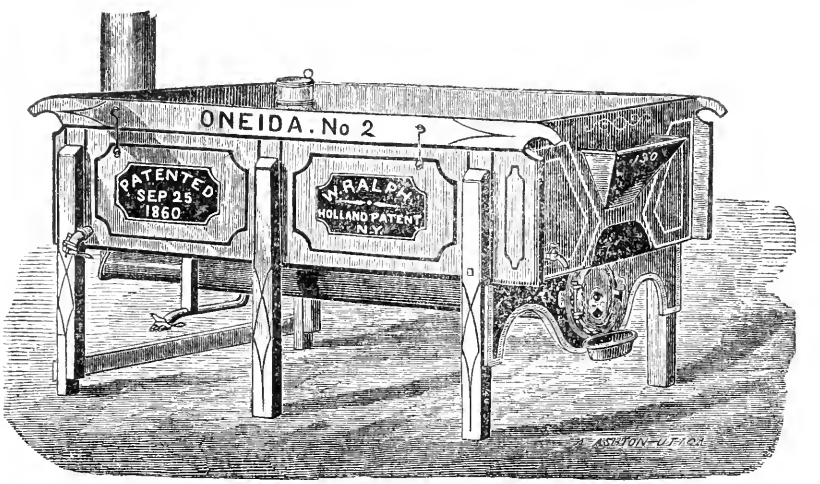
Let it be understood, that we do not take the ground that nothing but poor, miserable cheese must *necessarily* be made from milk, a portion of which has been raised to high heat, and when the breaking, cooking and handling of the curd is managed after the old manner. What has been the result of our experience is,

that milk and curd so treated are injured, and will not make so large a quantity nor so good a quality of cheese as when the improved method is adopted.

Vats and heaters, therefore, so constructed that the whole mass of milk can be warmed evenly and alike, and the heat at once controlled, together with a good thermometer, by which the requisite temperature can be ascertained, and a sharp-bladed instrument for cutting the curd, are of the utmost importance in cheese manufacture.

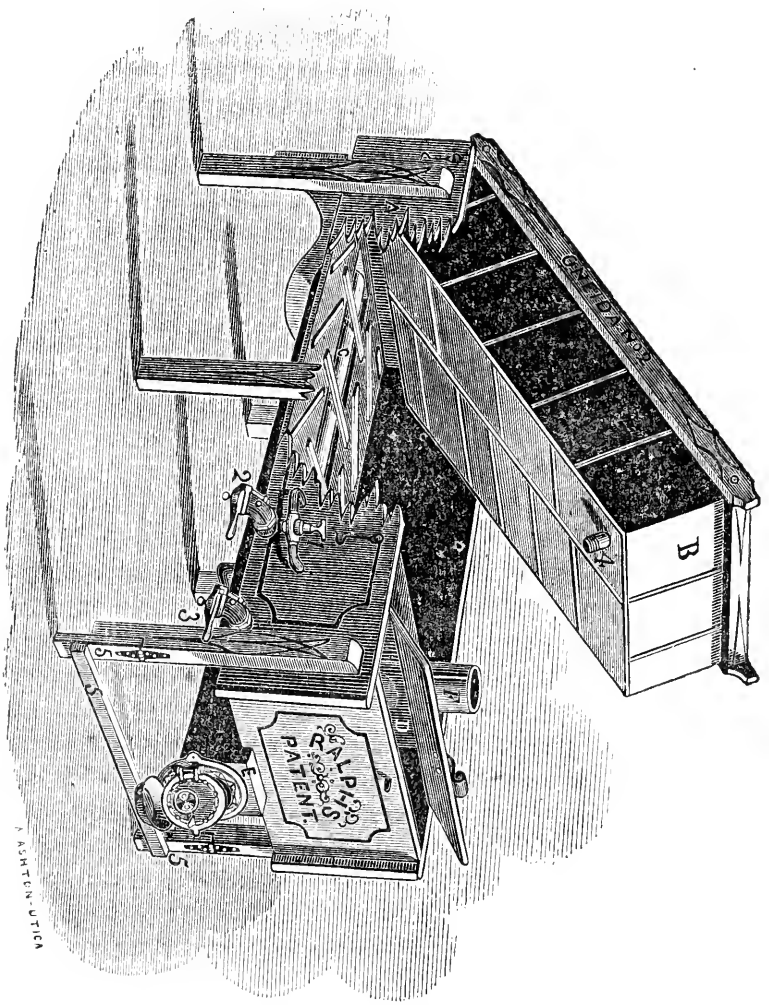
Various apparatus for making cheese have, from time to time, been invented and put to use, nearly all of which are improvements over the tub and its accompanying implements.

Among the pioneers in this department of dairy improvements, was Mr. G. Farmer, of Herkimer, in this county, who first employed the vats and steamer—his invention was in use as early as 1840. After him, Mr. Paine, of this county, had an improved apparatus, at one time quite extensively used in some localities; and almost every year brings out something new in this direction.



From considerable observation and experience in the manufacture of cheese, and the means to be employed for the purpose, it is believed that Ralph's Oneida cheese vat and heater is *the best*, or among the best as yet invented for the purpose intended. It takes but little fuel—heat is distributed evenly and can be controlled. It is the simplest of all the apparatus we have seen, compact, substantial, does the work well, and not liable to get out of repair, and is therefore here recommended. This is one

of the recent improvements, but has been thoroughly tested by many of the best dairymen of Herkimer and Oneida, and by them and by us preferred.



As a good cheese apparatus is now regarded by dairymen as of the highest importance, the dairy public, it is believed, will be benefited by an acquaintance with this vat and heater. The preceding cuts will more fully illustrate the apparatus. It will be seen from the cut, that fuel is to be applied at the end, the heater extending the whole length of the apparatus. This gives advantages for working on either side, and the heat being distributed from end to end warms the water between the vats evenly

and alike. The pipe at the end passes through a water tank where water is heated for cleaning up, and is never so warm as to be uncomfortable; the arrangements for cooling the milk, canting the vat and drawing off whey are all very convenient, and the outer vat being lined with galvanized sheet iron, renders the whole substantial and lasting.

THE CURD KNIFE.

One of the late and really valuable improvements for cheese manufacture is the curd knife, invented a few years since by D. G. Young, of Cedarville, in this county. It is not deemed necessary to explain why a polished and sharply cutting instrument like this, is superior to one that will bruise the curd and press out its oily particles. It is sufficient to say that this cutter is universally recommended by our best dairymen, and no cheese should be manufactured without it. The accompanying cut represents the implement.

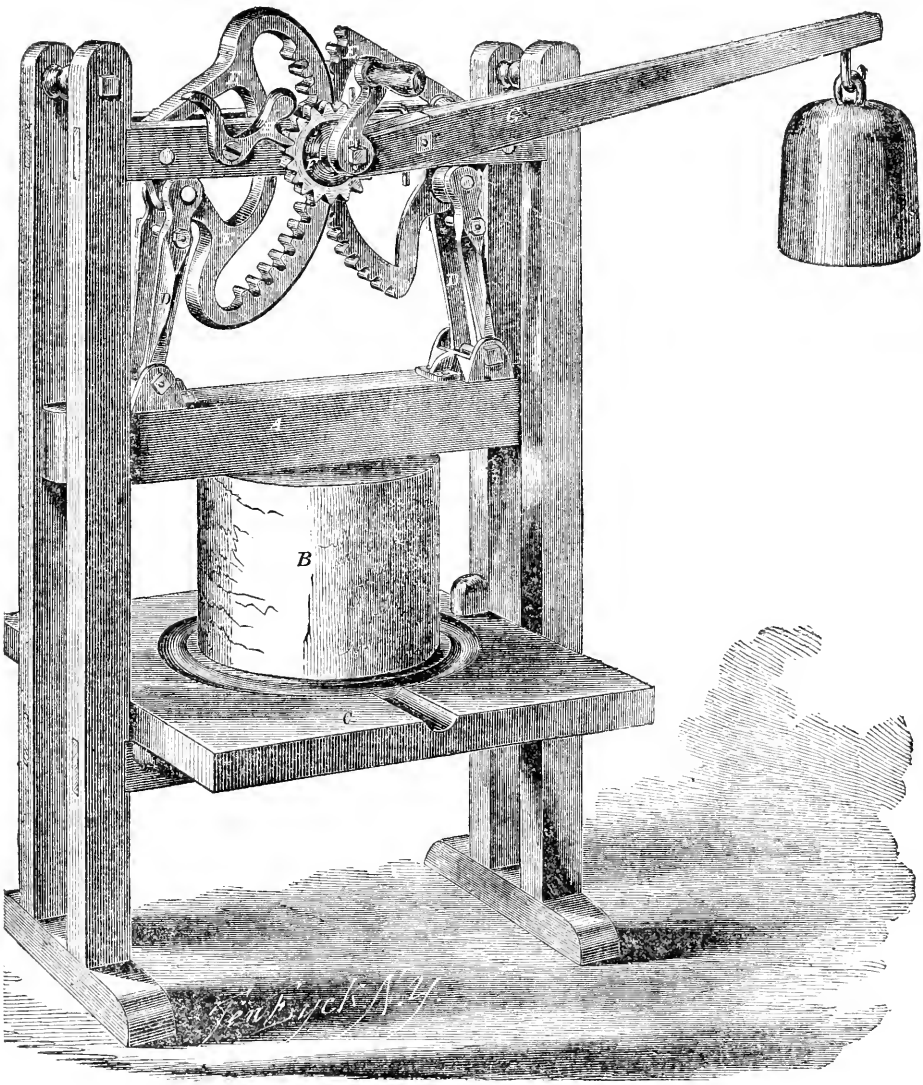
This knife is to be used during the process of cooking, and until the particles of curd are not much larger than wheat kernels. Each particle then, it will be seen, must be scalded evenly and alike. Where the particles are large, the outer portions are liable to be cooked too much and the inner parts not enough, which, when run up into cheese, is done so at a loss. The curd being of unequal texture, unequal fermentation, with trouble in curing, will be the result which will affect the quality of cheese. It is estimated by good dairymen that the gain from using this knife, over the old cutter and hands for breaking the curd, is from two to four lbs. for every 100 lbs. of cheese made; but be this as it may, the gain in quality and evenness of cheese, by using the knife during the season, will be considerable, while the work is very much less for the cheese-maker.

PRESSING.

The curd should be properly pressed and the whey expelled, otherwise great losses will be sustained, for if the whey does not soon find its way out, it becomes sour and putrid, and gives bad flavor to the cheese.

Cheese should not be over-pressed—a certain amount of moisture is needed in the cheese to make it mellow, but this moisture

should be evenly distributed throughout the curd, never accumulating in such quantities as to be perceptible to the eye, or so as to run from the cheese after being taken from the press. The rind, top and bottom, should be closed and present a smooth and even surface. At about 80° the curd may be put to press, and in two or three hours after, the cheese should be turned and bandaged and again put in press. Twenty-four hours will be sufficient time for pressing. A good proportioned cheese is about half the height of its diameter.



Herkimer County Cheese Press.

The press should be strong, handy and faithful in its operations, following up its work as the curd contracts. "The Herkimer County press," recently invented by Chas. Oyston, of Little Falls, is believed to be the latest *improvement* in this branch of dairy implements. It is of such value that the accompanying cut and description are given, that the public may understand its merits.

The principal working parts consist of two sectors and a pinion placed between the two upper beams; their journals are in line; the two light spots seen on the upper beams are the journals of the sectors. One of these sectors is geared on the outer and the other on the inner face; the one geared on the inside laps past the other, so that the point of its cogs, when in line with the journals, coincides with the point of the cogs of the other sector—the pinion consequently gears into both of them at once. On the right side the pinion is concealed by the beams, but the ratchet wheel, which is secured to the pinion shaft on the outside of the beam, shows its position. In front of the ratchet is the lever, playing loosely on the shaft, and in front of the lever is the crank, secured by a pin.

On the left of the ratchet is a dog, which takes into the ratchet at either end, as required; there is also a dog screwed on a strong pivot on the backside of the lever with a hook on the top, while its lower end is shaped to work in the ratchet. Besides the already described journal in the sectors, there are others, one in each sector; the length of these journals is four inches; they, as well as the others, are wrought iron, turned up smoothly, and cast in the sector perfectly solid, by a new and ingenious process. From the last described journals depend four iron bars or pitmen, the bottom ends of which are circular, working in corresponding circular recesses in iron boxes fastened to the top of the follower, one pair at each end of the follower; they are secured to the boxes by bolts, making an ordinary knuckle joint. The press is simple, compact, strong and durable, the weight of iron being 116 pounds.

It will be observed that the follower receives its pressure from the sectors at four different points, which gives it a perfectly parallel or true motion up and down. The journals of the sectors work in iron boxes, which makes them very durable. The pinion makes $3\frac{1}{8}$ revolutions at each operation; the lever is four feet six inches long, which makes it have 88 feet at each operation of

pressing, if required. One pound at the end of the lever gives an average pressure of 258 lbs., but as the power is progressive, it is less to begin with and much greater near the end of the operation.

The board on which the cheese rests is 22 inches from the floor, which is the right height for manipulating a cheese comfortably.

The follower is 17 inches above this, which gives a clear space of 31 by 17 inches for the cheese.

NEW METHOD OF SALTING CHEESE.

In salting cheese, the general practice among dairymen is to drain the curd of whey, and then apply salt in the proportion of one pound of salt (a pure article) to from forty to fifty pounds of cheese, according to the time cheese is designed to be marketed.

The question has occurred with many, whether the salt could not be more easily incorporated by salting the milk, or applying it after coagulation and when the curd is sufficiently cooked. From experiments made in salting the milk, it seems the cheese manufactured was of good quality, but the proportion of salt required was at the rate of $3\frac{1}{4}$ ozs. to the gallon of milk, or 8 lbs. 2 oz. salt to 40 gallons, or about 40 lbs. cheese. The objection to salting in the milk is, that the whey is unfit for pigs and the large quantity of salt required. Mr. D'Angiles, of Oneida county, has recently advocated the plan of salting in the whey. His method is briefly as follows: When the curd is about sufficiently cooked, most of the whey is drawn off, leaving just sufficient to hold the mass in a loose and finely divided state, the salt is then applied and stirred through the mass. The advantages claimed are, that much hard labor is saved; that the salt is more evenly distributed through the curd, which is not bruised and the oily particles pressed out by rough handling. This method is being adopted by some, the proportion of salt used being graduated according to the amount of whey in the curd at time of salting and the character of cheese to be manufactured.

COLORING CHEESE, ETC.

One of the means employed to give cheese a *rich cream color*, is to expose the curd before and after salting to the air, instead of hurrying it into the hoop or press, as is usual with the majority of dairymen. Every cheese-maker must have observed the fine golden color acquired by particles of curd that have accidently remained out of the hoop and exposed during the day

to the atmosphere. This is the precise color desired by the dealers, and in warm weather an exposure long enough for the desired color is practicable, and the appearance of the curd can be materially changed for the better, by letting it remain in the vat or tub until it has acquired the proper temperature for the press.

It is always preferable to cool curd in this way, instead of using water or cold whey on the curd, as is sometimes done for this purpose, as these last have a tendency to impoverish the cheese, by washing out a portion of its richness, besides injuring somewhat its flavor.

Fine flavor, quality, and the proper texture in cheese are important requisites to ready sales and good prices, but all these may be present, and yet the cheese sell low in market from its bad appearance. The *eye* must be suited as well as the *taste*, and it is difficult to make the consumer believe that pale, white cheese is as rich as that which has a fine cream color.

Again, many dairymen are troubled more or less in preserving a smooth, elastic rind; the rind checks and deep cracks are found here and there in the cheese. This results often, and for the most part, from the air being allowed to blow on the young cheese; cheese when it comes from the press, and for several days after, or until the rind has a firm consistency, should be kept where the air may not blow directly upon it; and washing the cheese twice a week with hot sweet whey, will add much to its outward appearance. Annatto is in general use during spring and fall, for coloring milk for cheese making, but as much of it is adulterated with poisonous materials, its use should be avoided in summer, when the desired color to the cheese can be obtained as above described.

VARNISHING CHEESE.

When cheese is ready for market and about to be shipped, it is the practice with some dairymen to apply to each cheese a thin coating of varnish made from gum shellac.

The shellac is simply dissolved and applied with a brush. This coating gives the cheese a smooth glossy appearance, and, besides adding to its beauty, is said to keep the cheese from loosing weight or gathering mould. When cheese well cured are to be shipped to a foreign market, or are to remain in store several weeks or months, it is claimed the above treatment is

particularly beneficial, as serving to keep them in better condition with less loss, and, at the same time, adding so much to their appearance, as to induce readier sales than when not so treated. We have never made trial of gum shellac for this purpose in our own dairy, and, therefore, cannot speak positively of its merits; but have been assured by good dairymen that its application has been practiced with decided advantage. It is stated that the cheeses of Holland are usually covered with a coating of linseed-oil varnish, and is one of the principal causes of their preservation on long voyages, to keep them from losing weight; but anything that would be likely to impart flavor or taint to cheese would be very objectionable. This point should be ascertained with regard to the above compounds before venturing upon their use for the purpose above mentioned.

CHEESE MANUFACTORIES.

The opinion prevails with some that dairying can be carried on with more profit and ease by the establishment of cheese manufactories in neighborhoods, and where the milk from the several farms is daily delivered, measured and accounted for in cheese. Thus relieving the farmer from a considerable outlay of capital, care and confinement, while the manufactory, supplied with every convenience, and operated by responsible persons highly skilled in the art, is enabled to produce from the milk the largest quantity and best quality of cheese; its uniformity and large quantity together, commanding for it in market an advanced price over single dairies. Where cheese establishments of this character have been put in operation, they have in general given satisfaction to parties interested—the advanced price obtained for the cheese having in some instances covered the whole cost of manufacturing. These establishments are generally conducted on the principle of stock companies. Thus, a certain number of dairymen agree to deliver at the factory the milk from their herds at stated hours each day. An account is opened by the manufacturer with each person, the milk is measured as brought in, and the cheese numbered and weighed, and each person credited with his proportion of cheese. All this is conducted with so much system that, by referring to the books, the shrinkage or loss on any one cheese made during the season can at once be ascertained. The manufacturer is paid a stated price per hundred pounds for the making, care, &c., of cheese. With

regard to sales, or any matter requiring action on the part of the association, the number of votes of each person is in proportion to the number of cows from which he delivers milk. Hogs for consuming whey are furnished by each, also, in proportion to cows. Sometimes a person is employed by the season to gather up all the milk night and morning and deliver it at the establishment; the milk cans are placed by the farmer on a platform the height of the wagon, at some convenient spot near the buildings, the team comes along, gathers them in, delivers the milk, and on return, brings back each man his empty cans.

A brief allusion has been made to this plan of cheese manufacture, because it is comparatively new, and because it may possibly prove suggestive, not only to persons engaged in dairying, but as offering a feasible plan, perhaps the best, for those unacquainted with the art in districts where it is proposed to introduce dairy farming. The outlay for dairy apparatus and suitable buildings on each farm for conducting the business is considerable, and when it is taken into account how difficult it is to obtain first class dairy-maids, the care and confinement of a dairy, together with the losses that are annually sustained from carelessness, inattention, or want of knowledge on the subject in all its details, there is reason to believe the plan in time will be widely adopted.

CONCLUSION.

Dairy farming, to be conducted successfully in all its branches, requires study, order, system and experience; and, when well conducted, offers ample remuneration.

Nature herself seems to have stepped forward to protect the interests of the dairy, since only a comparatively small portion of the country is adapted to the business. It is more sure in its results than many other kinds of farming, because grass, its staple crop, is less liable to be unfavorably influenced by weather, less subject to the attacks of insects and blights, prejudicial to other plants. The fluctuation in prices, too, for dairy products is less than with other staples, where the field of competition is wider, the market value of the former seldom, if ever, falling so low, but that a fair remuneration is rendered the farmer for his toil and the capital invested. These products, too, in universal use throughout the civilized world, healthy and nutritious, are regarded not only as a *necessary* article of food, but also as a

luxury, hence they are of ready sale, and a large demand for them must always continue.

To the American dairyman the prospects of permanency in his business and ample remuneration are of an encouraging character, because he has established a footing in Europe which, by judicious management as to manufacturing and exporting the best quality of dairy products, can be made available in disposing of any amount of these staples.

This outlet is the more encouraging since the European, under high rents and taxation, is unable to compete with us in this branch of farming, and must ultimately turn his attention into other channels of agriculture. And while the home market can thus be kept clear, prices must of necessity rule high.

The Journal of Commerce, under date of January 4, 1862, publishes an important table of exports, from which it appears the exportation of products of the dairy to Europe, during the last three years, has increased each year in a ratio beyond the expectations of the most sanguine. The following table is given, showing the—

Exportation of Butter, Cheese and Lard from New York to Europe, for three years.

	lbs. butter.	lbs. cheese.	lbs. lard.
1859	2,494,000	9,287,000	11,015,000
1860	10,987,000	23,252,000	18,860,000
1861	23,159,000	40,041,000	47,290,000

Such an increase in the exportation of dairy products as that of last year is without a parallel, and, as greater efforts shall be made to manufacture only a choice article, England must in time look to this country for her main supply. These facts should stimulate those engaged in the business to renewed efforts of improvement in all that pertains to dairy management—to husband the soil, and bring it up to its best capacity in the production of such food as will make the best milk, to improve the milking qualities of stock, and the manufacture of butter and cheese, ever looking forward to better quality and increased quantity, so that the prosperity of the individual and the wealth of the nation be advanced.

Dairying, it is believed, offers great inducements for a judicious outlay of capital. It rests on no mere speculative basis—"up to-day, and down to-morrow," but is permanent in its character and prospects, and sure in its rewards.

It opens up a wide field for improvement—in the exercise of judgment, skill, taste and scientific research, chemistry, botany, geology, architecture, stock-breeding, agriculture, all are made to subserve the general business.

As a source of national wealth, dairying to-day falls behind no other interest in proportion to capital invested, and we hope yet to see all its resources developed, and understood, and the business so systematized that it shall rank *best* among the professions in the land.

BUTTER AND CHEESE IN STATE OF NEW YORK, AS PER UNITED STATES CENSUS, 1860.

Northern District.

	Butter.	Cheese.
Albany	1,318,323	72,005
Allegany	1,665,621	939,115
Broome	1,693,444	53,719
Cattaraugus	2,324,507	1,857,349
Cayuga	2,084,459	195,505
Chautauqua	4,479,697	1,153,257
Chemung	865,796	11,090
Chenango	5,046,772	1,446,538
Clinton	894,609	87,780
Cortland	3,375,372	828,055
Delaware	4,966,118	44,777
Erie	2,128,107	2,278,276
Essex	634,289	106,119
Fulton	717,095	665,684
Franklin	1,497,162	138,776
Genesee	959,465	119,502
Hamilton	80,324	7,170
Herkimer	1.251,872	10,901,522
Jefferson	4,890,980	4,773,109
Lewis	1,998,887	2,911,775
Livingston	1,151,877	235,195
Monroe	1,651,914	171,960
Madison	2,135,617	2,589,992
Montgomery	1,200,528	2,611,448
Niagara	1,257,891	197,916
Onondaga	2,363,284	1,127,283
Oneida	4,140,442	3,519,732
Ontario	1,188,103	217,934
Orleans	854,054	143,280

	Butter.	Cheese.
Oswego	2,171,833	1,108,456
Otsego	3,286,617	2,161,929
Rensselaer	1,279,844	626,683
Saratoga	1,500,607	169,489
Steuben	1,983,077	231,233
Schenectady	628,980	84,261
Schoharie	2,203,667	112,671
Schuyler	705,094	48,886
Seneca	663,107	15,284
St. Lawrence	7,193,597	2,353,887
Tioga	1,317,907	47,837
Tompkins	1,631,982	55,452
Warren	642,829	87,623
Washington	1,696,472	768,320
Wayne	988,430	144,640
Wyoming	1,500,824	981,946
Yates	808,630	77,496
	89,020,106	48,392,006

Southern District.

	Butter.	Cheese.
Columbia	1,401,954	71,330
Dutchess	2,134,209	40,553
Greene	1,294,099	21,300
Kings	124,158	------
Orange	3,033,805	------
Putnam	465,235	5,644
Queens	505,985	1,422
Richmond	7,257	------
Rockland	244,932	51
Suffolk	749,130	3,990
Sullivan	966,793	10,552
Ulster	1,834,078	100
Westchester	1,315,528	1,340
	14,077,173	156,282
Northern district	89,020,106	48,392,006
	103,097,279	48,543,288

Milk sold (northern dist.) 53,400 gals.; value $11,348 00
Milk sold (southern dist.) 3,090,177 gals.; value 74,371 00

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